

WHAT IS CLAIMED IS:

- 1 1. An ultrasound endoscope having a rigid tip end section
2 connected to a fore end of an angle section at the distal end of an
3 insertion instrument for accommodating an ultrasound transducer
4 along with endoscopic observation means including an illumination
5 means and an optical image pickup assembly unit;
6 said ultrasound transducer being accommodated in a front
7 portion of a generally tubular casing of said rigid tip end section, said
8 endoscopic observation means being fitted in a sloped wall section
9 provided on said casing on the rear side of said ultrasound transducer
10 and inclined obliquely upward in the rearward direction, and an
11 outlet opening of a biopsy channel outlet passage being opened in
12 said casing at a position between said endoscopic observation means
13 and said ultrasound transducer:
14 characterized in that:
15 said casing of said rigid tip end section is separable into a main
16 casing adapted to accommodate entire parts of said ultrasound
17 transducer and a separable head block adapted to accommodate at
18 least part of component parts of said endoscopic observation means

19 and separably joined with said main casing;

20 joining wall portions are provided along longitudinal split lines
21 at opposite lateral sides of said main casing and said separable head
22 block as well as along a transverse split line provided on the rear side
23 of said ultrasound transducer;

24 a foremost ring member of angle rings in said angle section is
25 removably fitted on a circular ring fitting surface provided around
26 joined base end portions of said main casing and said separable head
27 block; and

28 a fore end of an outer skin layer of said angle section is
29 extended forward beyond said ring fitting surface and fixedly
30 anchored on a circular outer skin layer anchor surface provided
31 around joined base end portions of said main casing and said
32 separable head block on the front side of said ring fitting surface.

1 2. An ultrasound endoscope as defined in claim 1, wherein said
2 biopsy channel outlet passage is inclined obliquely upward in the
3 forward direction toward an outlet opening on said rigid tip end
4 section, a connector pipe from a biopsy channel tube is fitted and

5 gripped in a rear end portion of said biopsy channel outlet passage
6 formed by joining upper and lower semi-circular grooves provided on
7 said separable block and said main casing, respectively.

1 3. An ultrasound endoscope as defined in claim 2, wherein both
2 of said biopsy channel outlet passage and said connector pipe are
3 arcuately bent at an axially intermediate portion.

1 4. An ultrasound endoscope as defined in claim 2, wherein said
2 separable head block is adapted to accommodate said illumination
3 means and optical image pickup assembly unit of said endoscopic
4 observation means.

1 5. An ultrasound endoscope as defined in claim 2, wherein said
2 illumination means has a light guide fitting hole formed by joining
3 semi-circular grooves provided on said separable head block and said
4 main casing, respectively, a diffuser lens is fitted in a lens fitting hole
5 provided on said main casing at a front end of said light guide fitting
6 hole.

1 6. An ultrasound endoscope as defined in claim 1, wherein said
2 optical image pickup assembly unit of said endoscopic observation
3 means has a lens tube of an optical objective lens system, said lens
4 tube of said objective lens system being fitted in a sloped lens tube
5 fitting hole provided on said rigid tip end section, said lens tube
6 fitting hole being inclined upward in the forward direction and
7 formed by joining upper and lower semi-circular grooves provided on
8 said separable head block and said main casing of said rigid tip end
9 section.

1 7. An ultrasound endoscope as defined in claim 6, wherein said
2 lens tube of said optical image pickup assembly unit is locked in
3 position in said lens tube fitting hole by stopper projections and
4 notches provided in corresponding positions on said lens tube and
5 said semi-circular groove on the side of said main casing.

1 8. An ultrasound endoscope as defined in claim 1, wherein said
2 main casing and said separable head block are securely fixed with

3 each other by the use of screws.

1 9. An ultrasound endoscope as defined in claim 1, wherein said
2 main casing and said separable head block are joined with each other
3 and securely fixed relative to each other by screws threaded thereinto
4 through said foremost ring member of said angle section.

1 10. An ultrasound endoscope as defined in claim 1, wherein
2 said main casing and said separable head block are joined with each
3 other through seal material.